

WHAT IS CLAIMED IS:

1. A method of removing more dense material from a fluid medium, comprising:

5 forming a centrifuge core with at least one receptacle having an opening and a flow path extending therethrough;

forming a centrifuge with the centrifuge core disposed within an outer non-rotating collecting sleeve;

10 rotating the centrifuge core around an axis of rotation to create centrifugal force to separate the more dense material from a fluid medium by directing the more dense material through the opening into a void area formed by the receptacle and through the flow path to a collection zone between the centrifuge core and the non-rotating sleeve; and

15 creating an excitation force within the centrifuge such that the excitation force imparts a vibration on the more dense material.

20 2. The method of Claim 1, further comprising compacting the more dense material in the receptacle with the aid of the excitation force.

25 3. The method of Claim 1, wherein the excitation force comprises a vibratory device operable to partially fluidize the more dense material causing the more dense material to move towards the opening.

4. The method of Claim 1, further comprising controlling a removal rate of the more dense fluid with the excitation force.

5 5. The method of Claim 1, further comprising dampening the excitation force with a flexible middle layer such that the excitation force is substantial limited to the receptacle.

10 6. The method of Claim 1, further comprising creating a motion with the excitation force, wherein the motion is selected from the group consisting of axial, radial, linear, torsional, and arced.

15 7. The method of Claim 1, further comprising: separating the fluid medium into a clarified fluid and a waste fluid whereby the clarified fluid stream includes the fluid medium with a smaller percentage of more dense material and the waste fluid includes the 20 fluid medium with a higher percentage of the more dense material; and

removing the waste fluid through the flow path in each receptacle.

25 8. The method of Claim 1, further comprising creating the excitation force with a frequency in the range of 100 Hertz (Hz) to 40,000 Hz.

30 9. The method of Claim 1, further comprising creating the excitation force with an amplitude in the range of 0.1 milliwatts to 150 kilowatts.

10. The method of Claim 1, further comprising activating the excitation force during the operable of the centrifuge such that the excitation force is continuous.

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11. The method of Claim 1, further comprising activating the excitation force based on the operating conditions of the centrifuge such that the excitation force is condition responsive.

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12. The method of Claim 1, further comprising activating the excitation force at periodic intervals such that the excitation force is cyclical.